

WHAT IS CLAIMED IS:

1. A method for electrifying a plurality of electric conductors arranged on a substrate comprising the step of setting an average temperature difference during electrifying processing between a region  $S_0$  in that the plurality of electric conductors on the substrate are arranged and a region  $S_1$  located on the periphery of the region  $S_0$  at 15°C or more,

wherein the substrate satisfies the relational expression:

$$L_1/L_0 > E\alpha\Delta T/\sigma_{th} - 1.$$

where  $L_0$ [m]: the width of the region  $S_0$

$L_1$ [m]: the width of the region  $S_1$

$\Delta T$ [K]: the average temperature difference

$E$ [Pa]: the Young's modulus of the substrate

$\alpha$ [/K]: the coefficient of linear thermal expansion of the substrate

$\sigma_{th}$ [Pa]: the material constant of the substrate

2. A method for manufacturing an electron-source substrate comprising the steps of:

electrifying a plurality of electric conductors arranged on a substrate in a hermetic atmosphere so as to impart an electron-emission function to part of the electric

conductors; and

setting an average temperature difference during the electrifying processing between a region  $S_0$  in that the plurality of electric conductors on the substrate are arranged and a region  $S_1$  located on the periphery of the region  $S_0$  at 15°C or more,

wherein the substrate satisfies the relational expression:

$$L_1/L_0 > E\alpha\Delta T/\sigma_{th} - 1.$$

where  $L_0$ [m]: the width of the region  $S_0$

$L_1$ [m]: the width of the region  $S_1$

$\Delta T$ [K]: the average temperature difference

$E$ [Pa]: the Young's modulus of the substrate

$\alpha$ [/K]: the coefficient of linear thermal

expansion of the substrate

$\sigma_{th}$ [Pa]: the material constant of the substrate

3. A manufacturing method according to Claim 2, further comprising the step of cutting the substrate into desired sizes after the electrifying processing.

4. A manufacturing method according to Claim 3, wherein the cutting step comprises making dust-proof for covering the region of the electric conductors and at least one of the steps of wheel-cutter cutting, dicing, and

sandblast cutting.

5. A manufacturing method according to Claim 3, further comprising the steps of chamfering, polishing, and cleaning the periphery of the substrate after the cutting.

6. A manufacturing method according to Claim 2, wherein the electrifying step in the hermetic atmosphere comprises the steps of covering the region of the electric conductors on the substrate with a container, and exhausting and introducing gas after the covering step.

7. A manufacturing method according to Claim 2, wherein the electric conductors each comprise a pair of electrodes and a conductive film formed between the electrodes and the electrodes are electrically connected to wiring.